



## ***Fourth GAIN World Conference***

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June 14-15, 2000

# **Economic Benefits of Airline Safety Programs**

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***Capt. Bertrand de Courville***  
***Flight Safety Manager***  
***Air France***

## **Business and Safety : two axioms**

- **ALARP: Keep our risks As low As Reasonably Practicable.**
- **ASSIB: And Still Stay In Business !**

# ***Safety Management ?***



# ***or Risk Management ?***

# ***Safety or Risk Management ?***

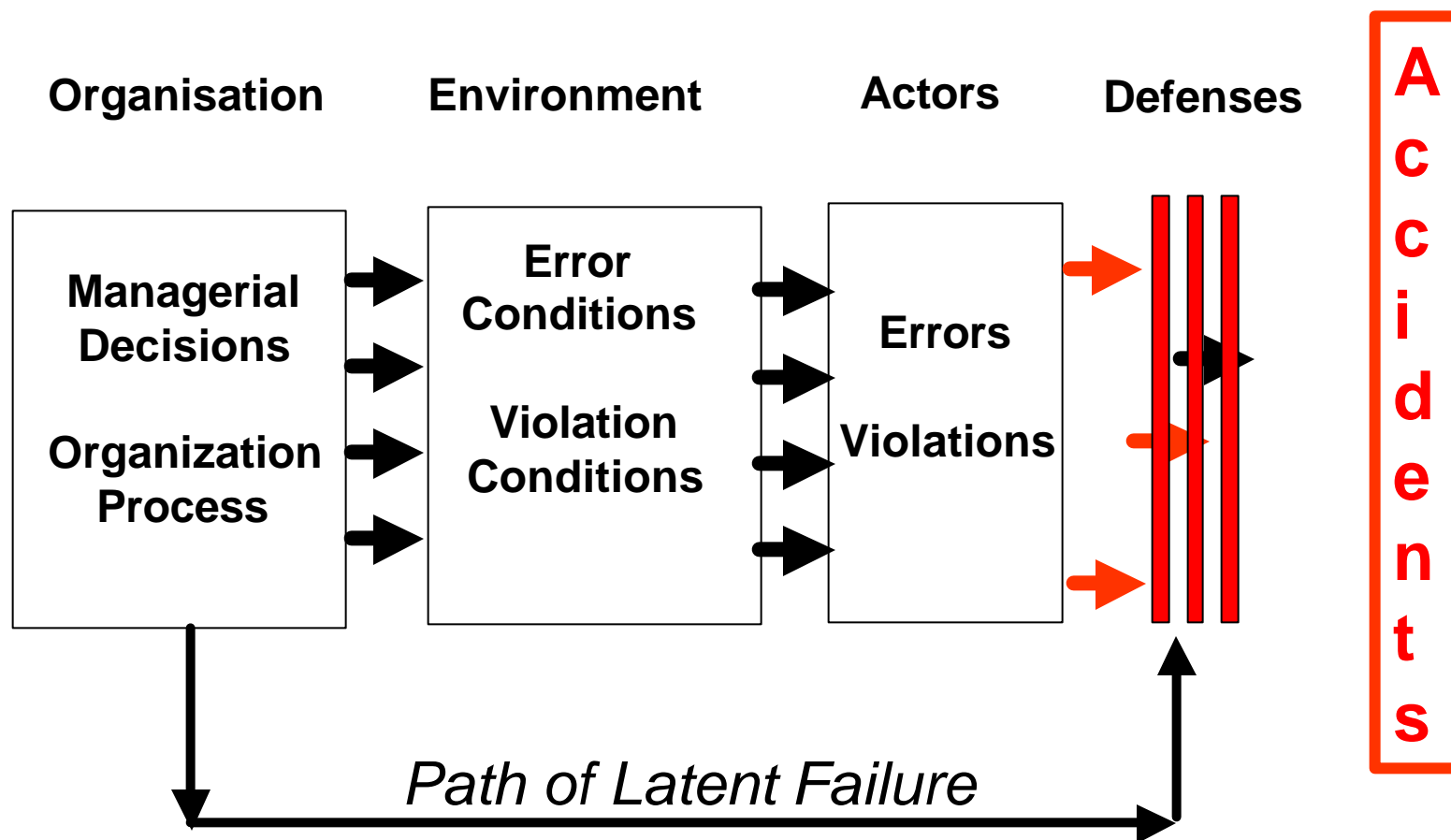
- Risk management is a universal approach for managing unexpected potential loss (true for financial, operational, commercial risks etc.)
- Accidents are poor indicators for safety
- Absence of accident is not absence of risk exposure

## ***What do we know about accidents ?***

**Accidents result from a combination of :**

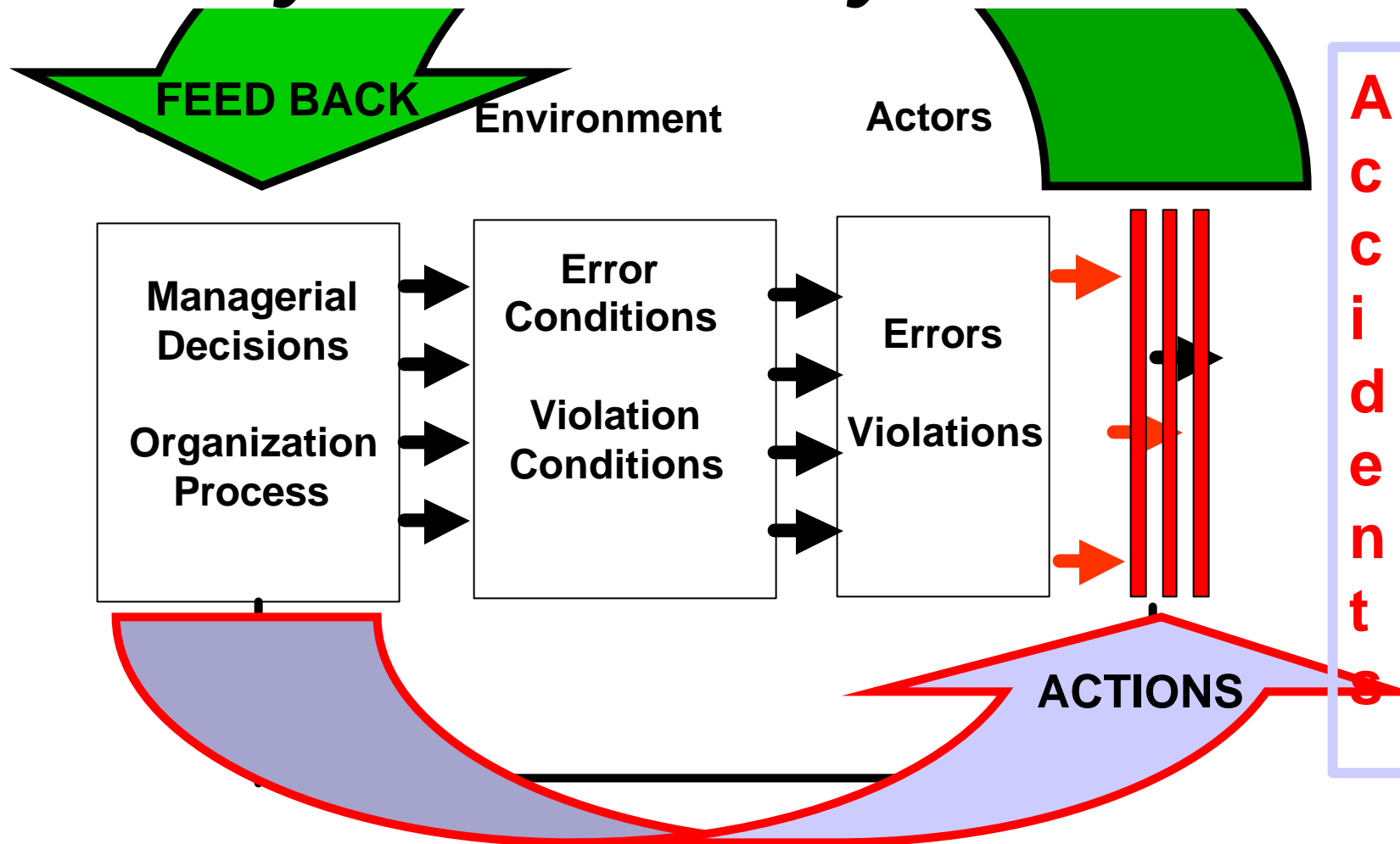
- **“ latent ” failures (related with the airline’s organization)**
- **“ active ” failures (related with actions and decisions by “ front line actors ”, i.e. pilots, mechanics, dispatchers, air traffic controllers, etc.)**

# ***Organizational Safety Model***

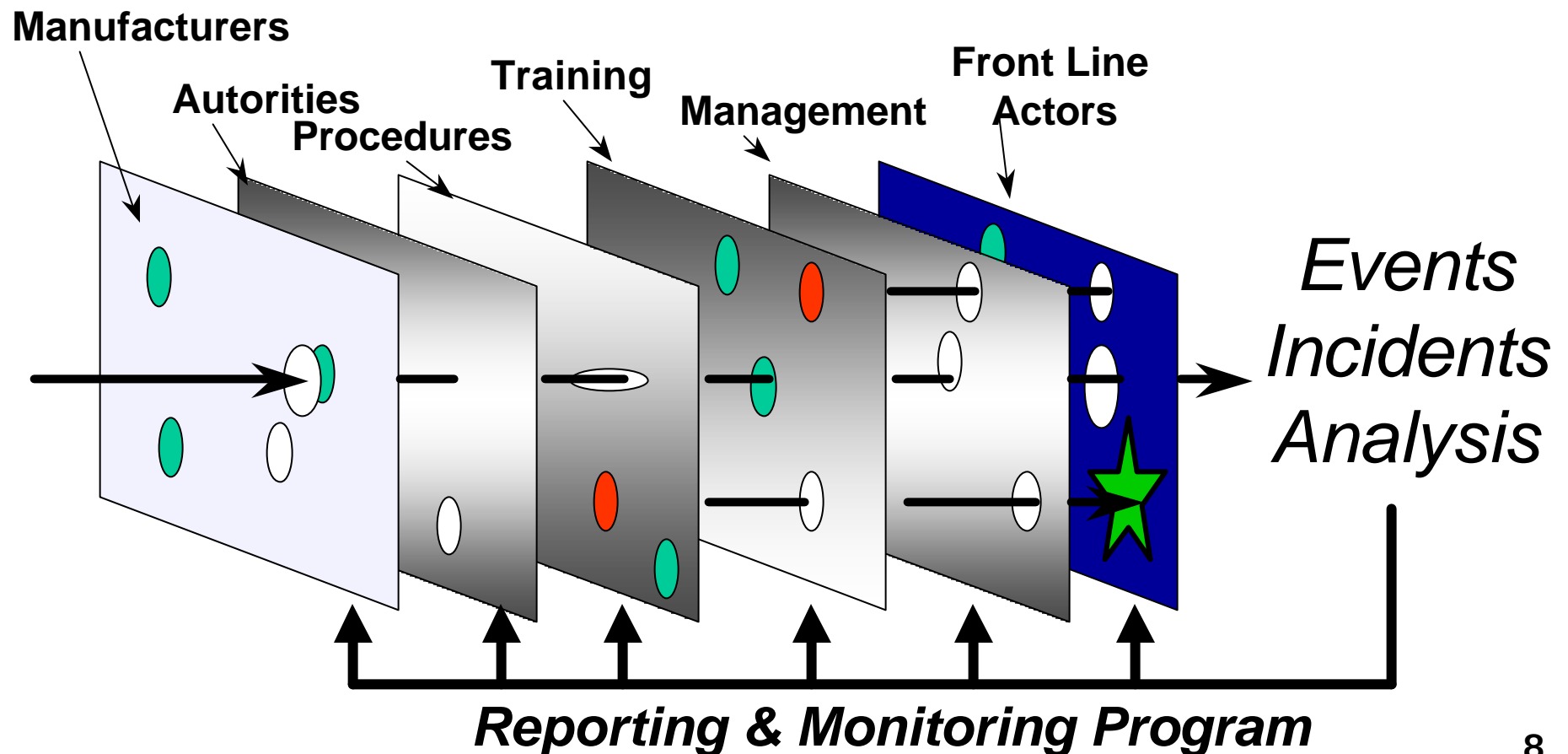


*After James Reason*

# ***Dynamic Safety Model***

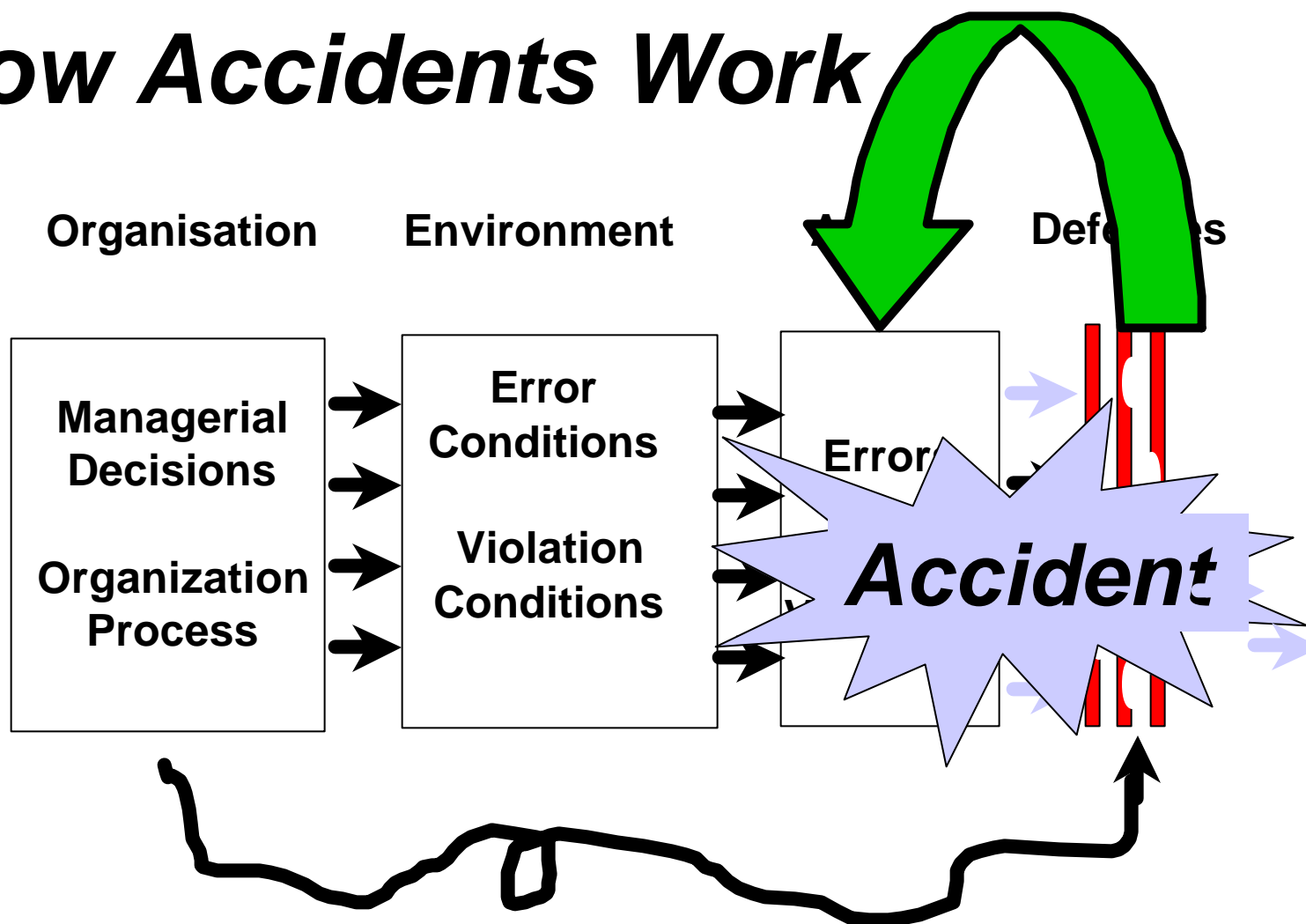


# ***Each Level is both Source of Risk and of Prevention***





# *How Accidents Work*



## ***Two Adaptation Strategies***

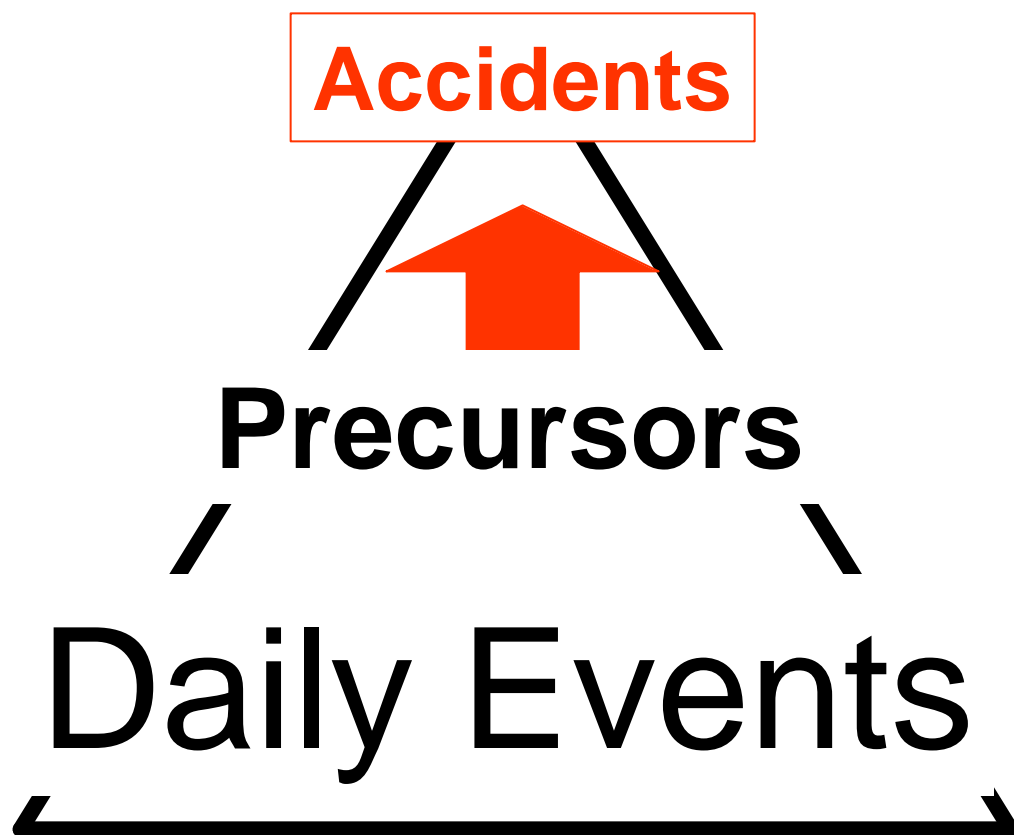
**« Jurassic » One :**

- **Fly - Crash - Fix - Fly - WAIT ...**

**« Proactive » One :**

- **Fly - Detect - Analyse - Fix - CHECK...**

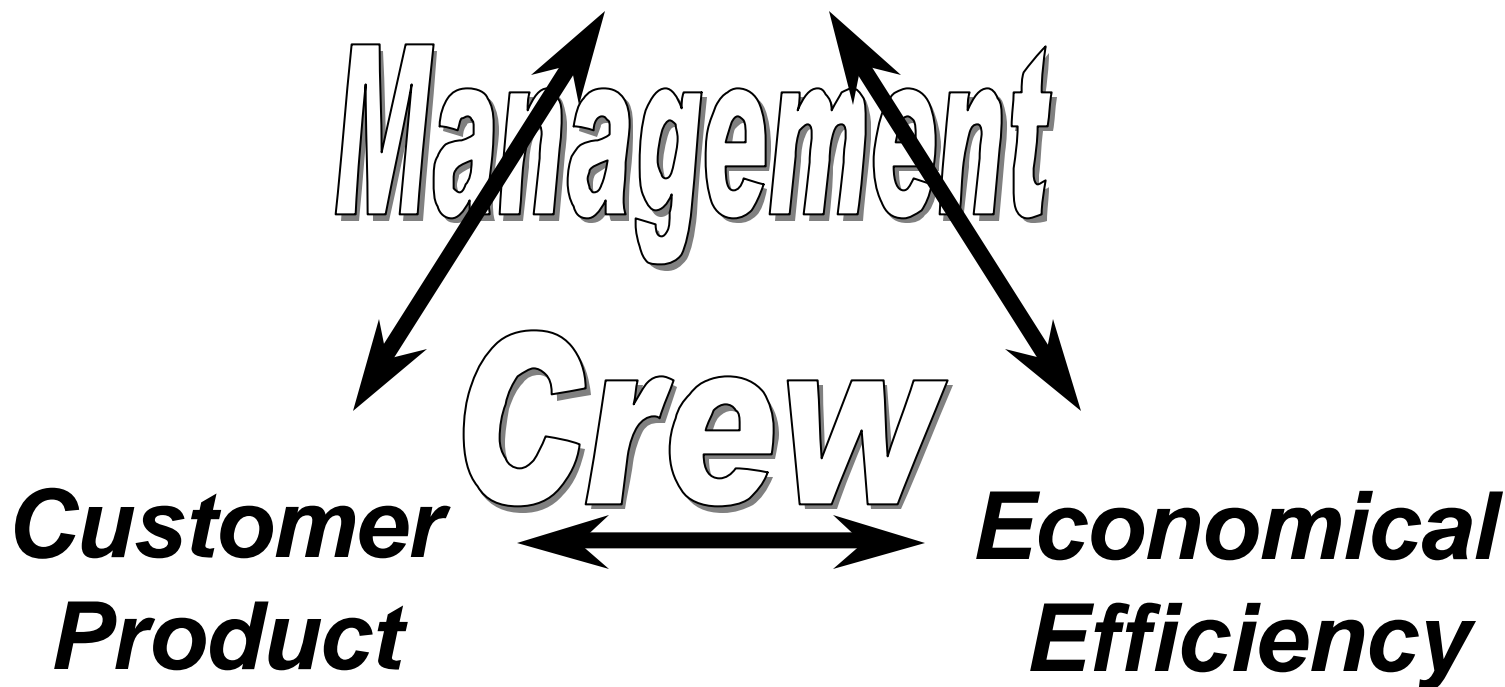
## Managing precursors, not accident ...



**PRECURSORS**  
*Runway Incursions*  
*Altitude deviations*  
*Deviations Below MSA*  
*Unstabilized Approaches*  
*Rwy/Arpt Confusions*  
*Navigation deviations*  
*Flap set. error/omission*  
*Etc .*

# ***THE SAFETY CHALLENGE***

***Operational Risk***



# ***Potential Decision Bias***

## **PRODUCTION**

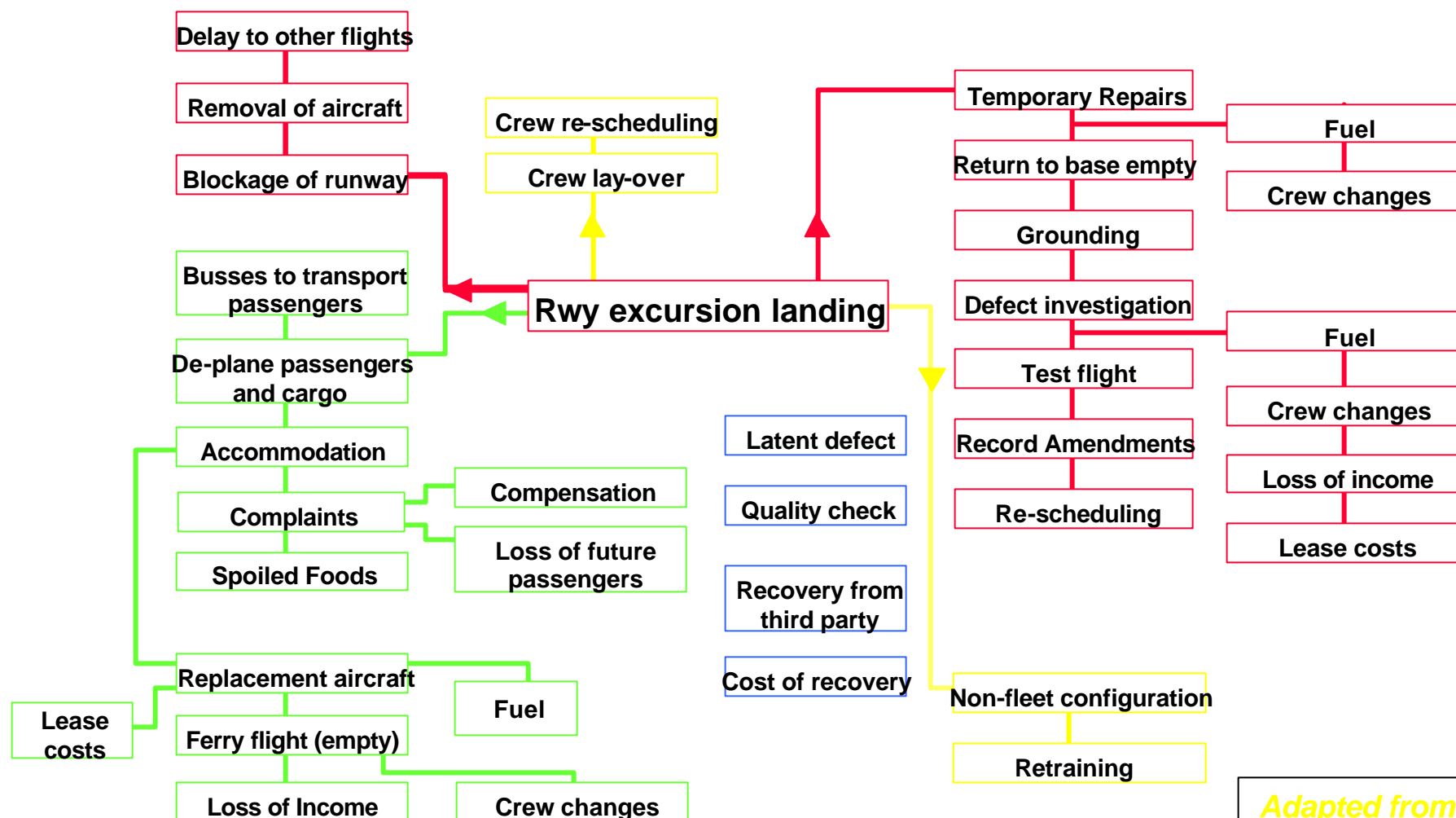
- **Measurable Results**
- **Short term Benefits**
- **Visible Success**
- **Reliable Indicators**

## **PROTECTION**

- **Ambiguous results**
- **Long term Benefits**
- **Visible Failures**
- **Unreliable Indicators**

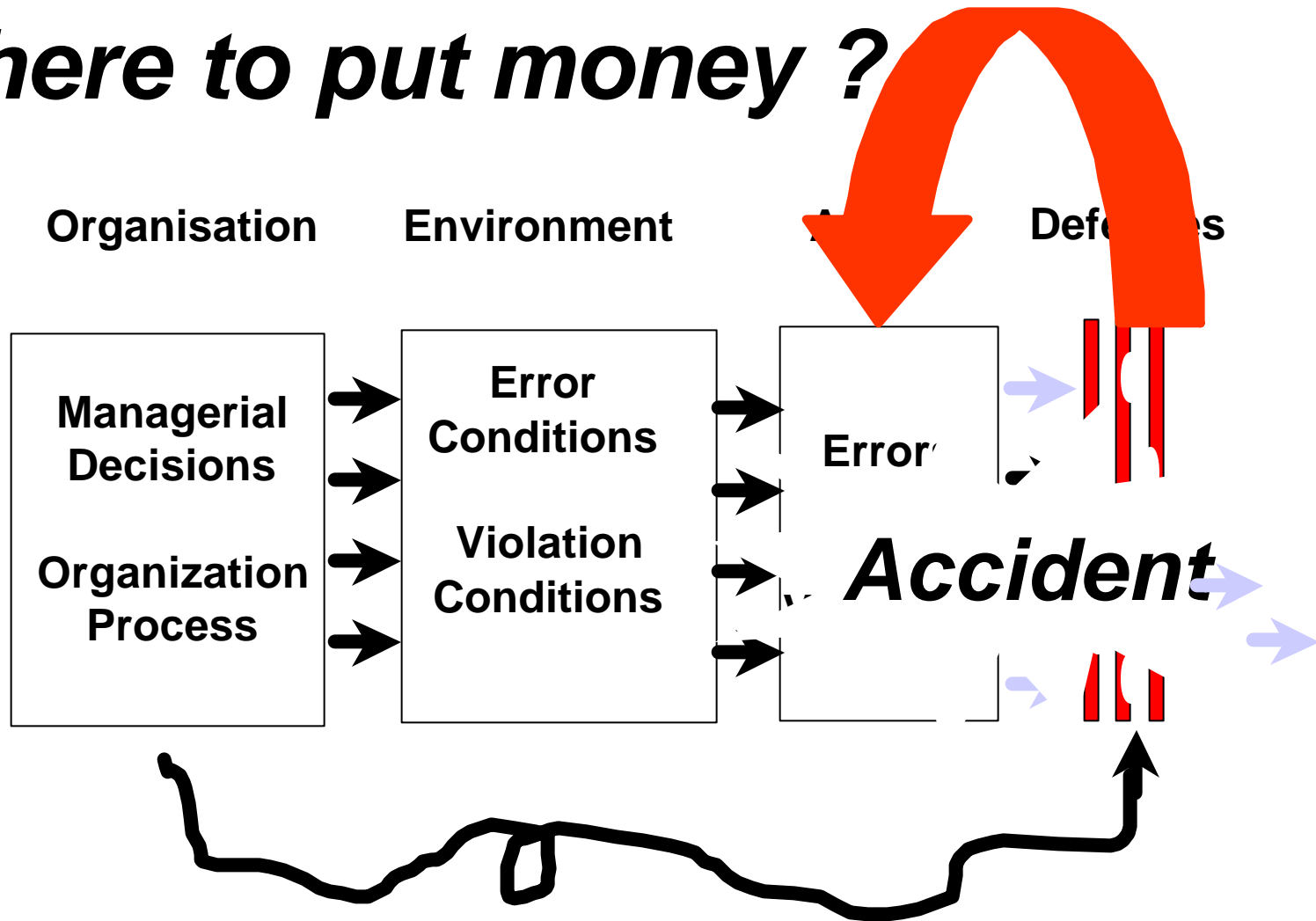
*We remember that ...*

**The same factors which are  
creating accidents ...  
are creating production losses,  
as well as quality and cost  
problems.**



*Adapted from  
Willis Corroon*

# *Where to put money ?*





# *Detecting Precursors*

**Precursors bring « free » opportunities :**

- **to understand our operation as they are ... not as we wish they are**
- **to assess and adapt at a minimal cost (without accident) our DEFENSES : procedures, documents, training and risk awareness within the airline**

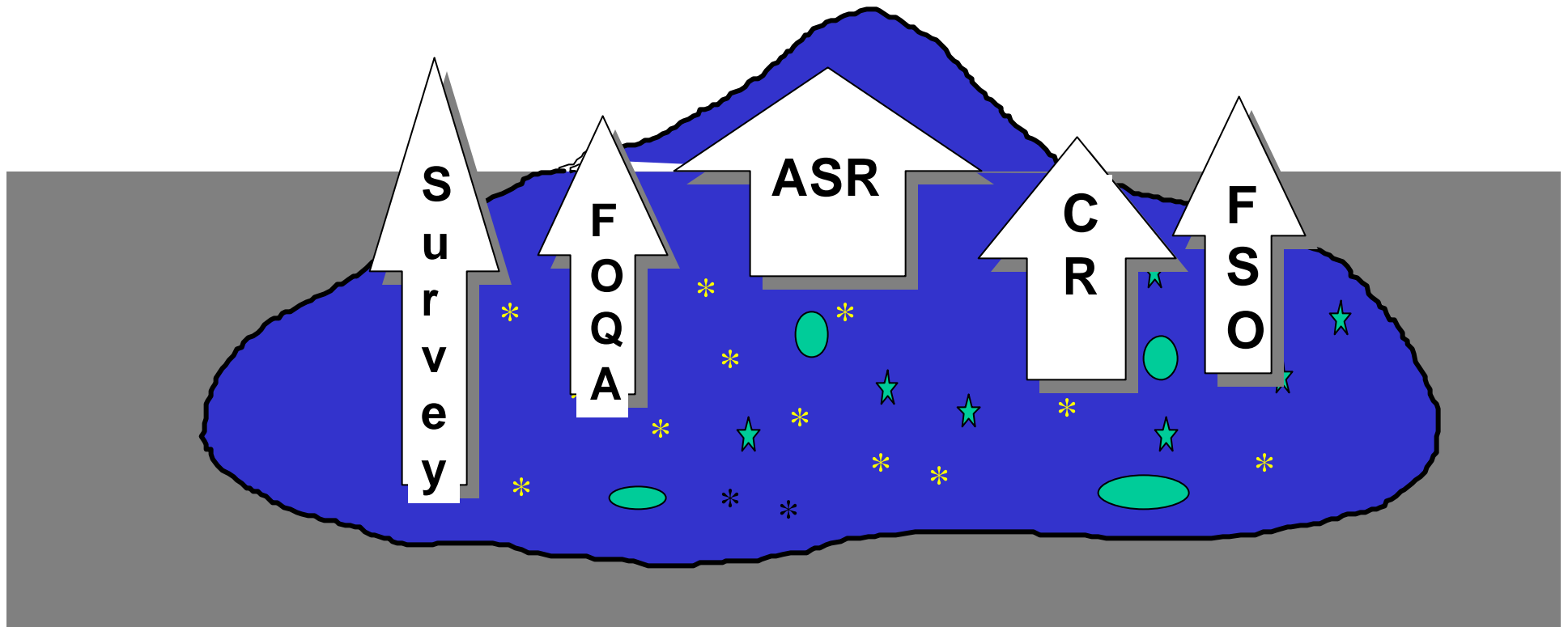
**WE HAVE TO MAKE THE PRECURSORS  
VISIBLE, UNDERSTANDABLE AND USABLE**

## *Think about this ...*

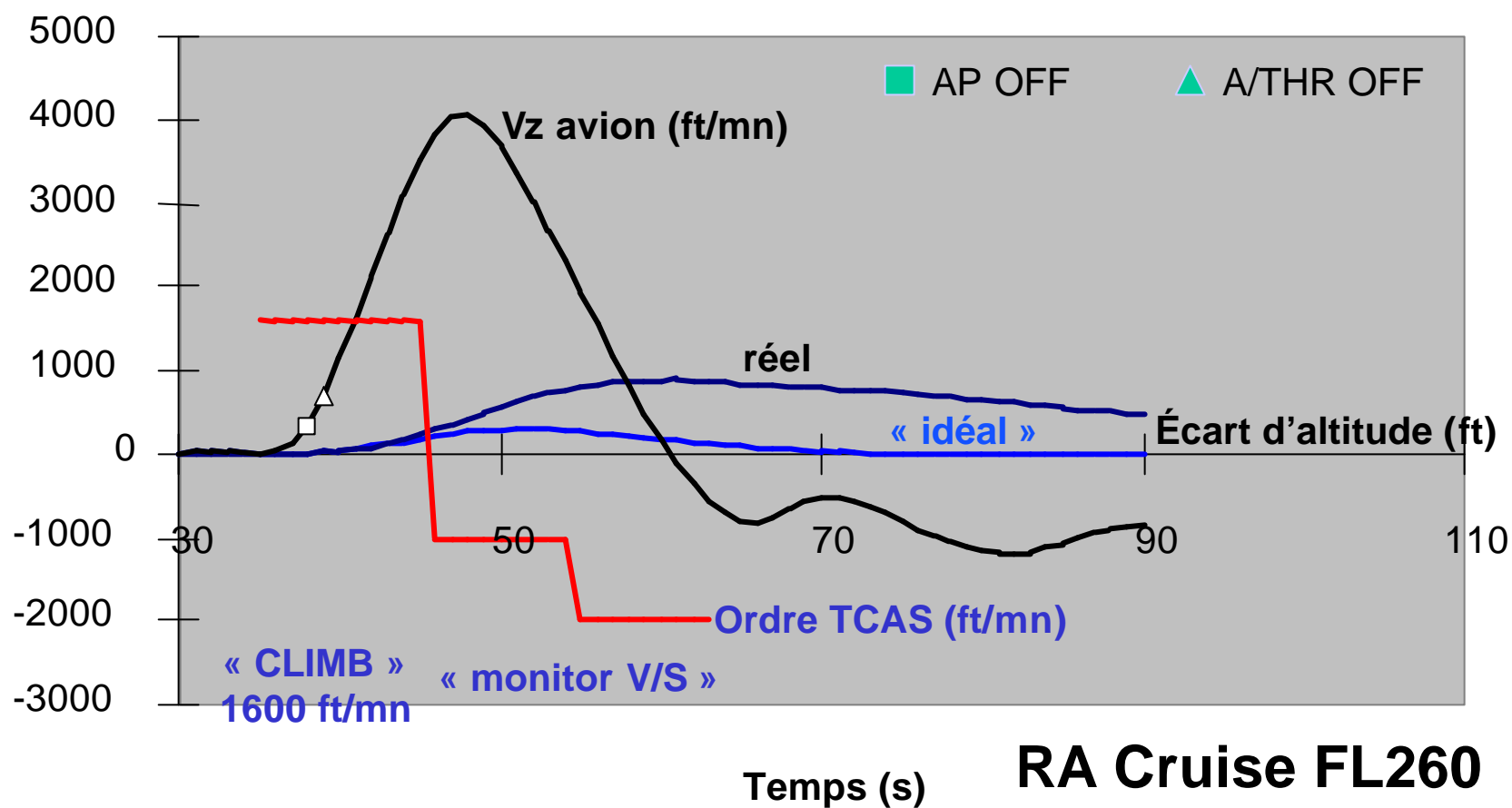
- «***No Event***» means «***No Reported Event***»
- **Low visibility events are a threat for an airline (only visible things are manageable)**
- «***A safe airline***» does not mean an airline without safety related events

# *Assessing Defenses*

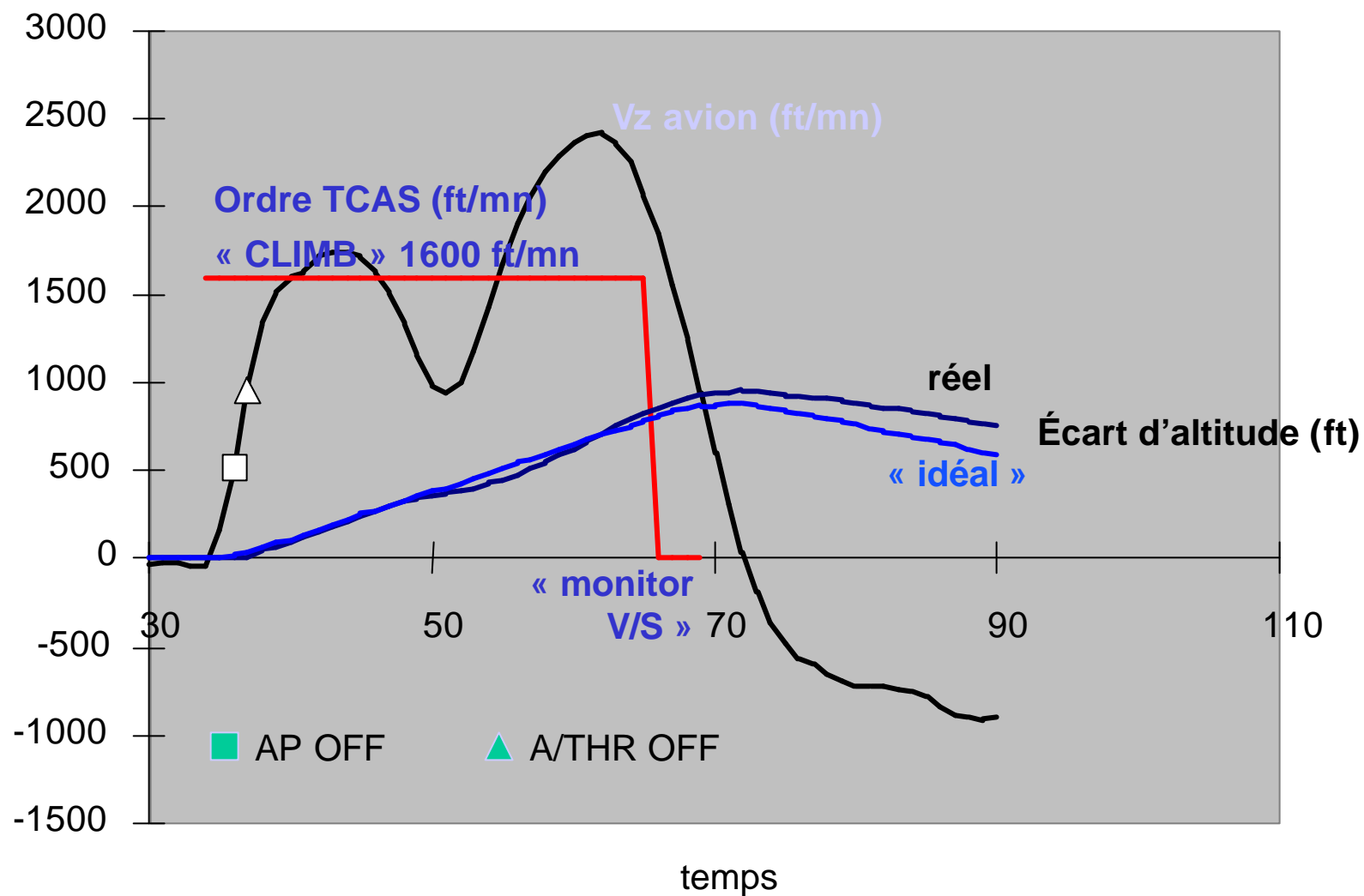
***Make events visible***



# FOQA RA TCAS Analysis



# FOQA RA TCAS Analysis



# ***Conclusion***

- **Accident prevention is an dynamic process.**
- **A good safety program enable an airline to adapt continuously to constraint change at an acceptable cost.**
- **Non consequence safety related events should “feed” the process through multiple feed back systems and analysis tools**
- **If this is not done, adaptation will take place after an accident at an unacceptable cost**